ABSTRACT

Methods, algorithms, software, architectures, systems and circuits for targeting certain dominant error types in an adaptive FIR filter and/or signal equalizer. The method and algorithm generally include processing a data sequence in accordance with the adaptive algorithm to produce a processed data sequence, filtering the data sequence to generate a filtered data term for the adaptive algorithm, generating a filtered error term for the adaptive algorithm from at least the processed data sequence , and updating the adaptive algorithm in response to the filtered data and error terms. The software is generally configured to implement one or more aspects of the inventive methods disclosed herein. The architectures generally include an equalizer configured to equalize and/or filter a data sequence in accordance with an adaptive algorithm and provide an equalized data output, a first filter configured to receive the data sequence and generate a filtered data term for the adaptive algorithm, and an error term circuit configured to receive the equalized data output and provide a filtered error term for the adaptive algorithm. The filters may be structurally and/or functionally identical to each other. The systems generally include the architecture and, for example, a receiver and/or magnetic recording device. The present invention advantageously improves convergence speed relative to conventional LMS algorithms for FIR filtering of digital data, and improved performance relative to LMS algorithms that are best-in-class for convergence speed.